

# Catheter Fracture and Cardiac Migration: A Rare Complication of Totally Implantable Venous Devices

ISIDORO DI CARLO, MD, PhD\*, PIERO FISICHELLA, MD, DOMENICO RUSSELLO, MD,  
STEFANO PULEO, MD, AND FERDINANDO LATTERI, MD  
*I Clinica Chirurgica, Università di Catania, Catania, Italy*

Totally implantable venous device (TIVD) are widely used for the treatment of patients requiring long-term chemotherapy, total parenteral nutrition and fluid replacement. Until today, many kinds of complications have been reported in the literature. We report an unusual case of catheter fracture as a consequence of pinchoff syndrome, and discuss the potential methods to avoid this complication and its evolution.

*J. Surg. Oncol.* 2000;73:172–173. © 2000 Wiley-Liss, Inc.

**KEY WORDS:** totally implantable venous device; pinch-off

## INTRODUCTION

Totally implantable venous devices (TIVDs) significantly contribute to the treatment of patients requiring long-term chemotherapy, total parenteral nutrition, fluid replacement, and frequent blood sampling [1]. TIVDs considerably improve the quality of life for these patients by giving them unrestricted ability and freedom in their choice of activity [1]. However, many complications have been reported in the literature [2]. We report a case of catheter fracture as a consequence of pinch-off syndrome.

## CASE REPORT

In December 1998, a 67-year-old woman affected by metastatic carcinoma of the left breast received, at another institution, a TIVD in the right subclavian vein by the Seldinger technique with a peel-away sheath. The TIVD was utilized for a course of chemotherapy. In January 1999, the patient was admitted to our hospital because of subcutaneous extravasation of chemotherapeutic drugs after injection into the TIVD. A chest radiograph obtained at the time of admission showed a fracture of the silicon catheter below the clavicle (Fig. 1a) and the distal portion of the catheter embolized into the right atrium (Fig. 1b). The day after, in the absence of any further symptoms, this distal fragment was pulled out percutaneously through the right femoral vein. Two days after, the proximal portion of the catheter and the port were removed. A week later, a second TIVD was im-

planted in the left cephalic vein using the surgical cut-down technique.

## DISCUSSION

Since the mid-1980s several advantages have resulted from the increased use of TIVDs. These devices usually can be implanted in the cephalic vein using the cut-down technique or by puncture of the subclavian vein using the Seldinger technique. Following use of the last method, in 1984 Aitken and Minton [3] first described the so-called pinched-off sign, consisting of a narrowing of the catheter as it passes over the first rib and beneath the clavicle. At catheter insertion, the angle between the clavicle and the first rib is wide and the catheter can pass through it medial to the vein before entering the subclavian vein. In the upright position, the angle narrows and leads to a mechanical compression of the medially positioned catheter. On the basis of a radiographic scale, Klotz et al. [4] suggest, in the presence of the typical pinch-off sign, removal of the catheter system within 6 months. In our case, the catheter was interrupted only 1 month after insertion, suggesting that, when the pinch-off sign is present, the catheter should be removed immediately to avoid fatal complications. When the catheter is inserted by puncture of the subclavian vein using the Seldinger

\*Correspondence to: I. Di Carlo, MD, PhD, via Regina Margherita 180, 98034 Francavilla (ME), Italy. Fax: +39 0942 982475. E-mail: dicarlo@tau.it

Accepted 10 September 1999

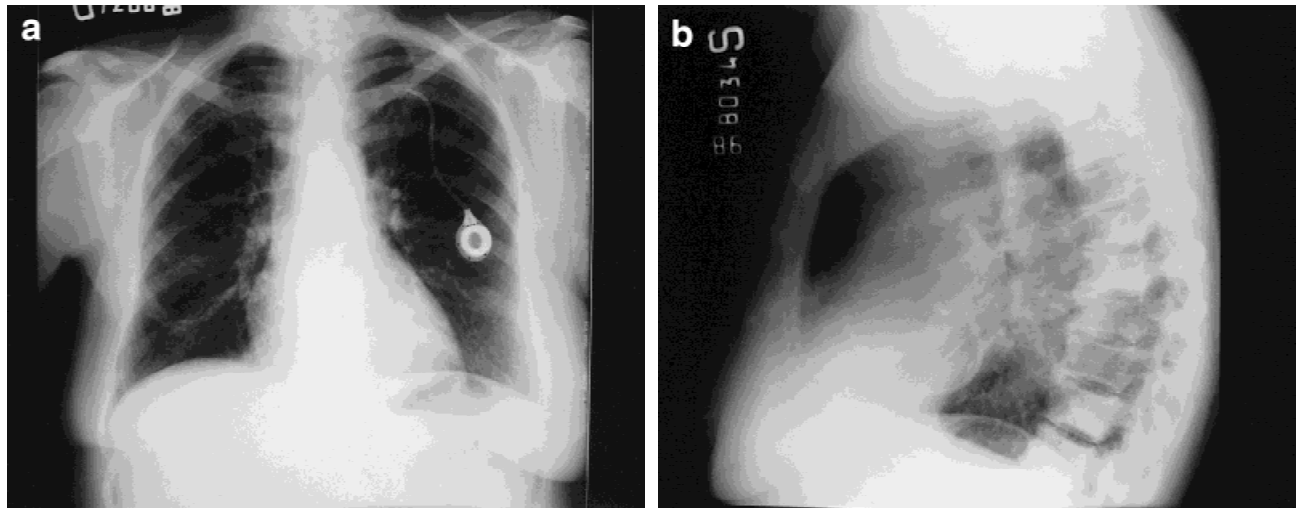


Fig. 1. **a:** Fracture of the catheter over the first rib and beneath the clavicle. **b:** Fractured catheter embolized into the right atrium.

technique, the pinch-off sign is observed in 1.1%–5.0% of cases [2,4,5]. This complication and the possible evolution into a more dangerous catheter fracture can be avoided by using the cephalic vein cut-down technique [1].

#### REFERENCES

1. Kock HJ, Pietsch M, Krause U, et al.: Implantable vascular access systems: Experience in 1500 patients with totally implanted central venous port systems. *World J Surg* 1998;22:12–16.
2. Biffi R, de Braud F, Orsi F, et al.: Totally implantable central venous access ports for long-term chemotherapy. *Ann Oncol* 1998;9:767–773.
3. Aitken DR, Minton JP. The “pinch-off sign”: Warning of impending problems with permanent subclavian catheters. *Am J Surg* 1984;148:633–636.
4. Klotz HP, Schopke W, Kohler A, et al.: Catheter fracture: A rare complication of totally implantable subclavian venous access device. *J Surg Oncol* 1996;62:225–225.
5. Hinke DH, Zandt-Stansny DA, Goodman LR, et al.: Pinch-off syndrome: A complication of implantable subclavian venous access devices. *Radiology* 1990;177:353–356.